Amendments to the Specification: [1]

Please replace paragraph [0003] with the following amended paragraph:

In order for a TBC to remain effective throughout the planned life cycle of the component it protects, it is important that the TBC material has and maintains a low thermal conductivity. However, the thermal conductivity of YSZ is known to increase over time when subjected to the operating environment of a gas turbine engine. To reduce and stabilize the thermal conductivity of YSZ, ternary YSZ systems have been proposed. For example, commonly-assigned U.S. Patent No. 6,586,115 to Rigney et al. discloses a TBC of YSZ alloyed to contain certain amounts of one or more alkaline-earth metal oxides (magnesia (MgO), calcia (CaO), strontia (SrO) and barium oxide (BaO)), rare-earth metal oxides (lanthana (La_2O_3), ceria (CeO_2), neodymia (Nd_2O_3), gadolinium oxide (Gd_2O_3) and dysprosia (Dy_2O_3)), and/or such metal oxides as nickel oxide (NiO), ferric oxide (Fe_2O_3), cobaltous oxide (CoO), and scandium oxide (Sc_2O_3).

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[1] All references to pages and paragraphs in Applicant's electronically-filed application are those inserted by the USPTO authoring software.

According to Rigney et al., when present in sufficient amounts these oxides are able to significantly reduce the thermal conductivity of YSZ by increasing crystallographic defects and/or lattice strains. In commonly-assigned U.S. Patent No. 6,808,799 ~~Application Serial No. 10/064,785~~ to Darolia et al., a TBC of YSZ is deposited to contain a third oxide, elemental carbon, and potentially carbides. The resulting TBC is characterized by lower thermal conductivity that remains more stable during the life of the TBC as a result of stable porosity that forms when the elemental carbon and carbides within the TBC oxidize to form carbon-containing gases (e.g., CO).

Please replace paragraph [0004] with the following amended paragraph:

While the incorporation of additional oxides and carbon-containing compounds into a YSZ TBC in accordance with Rigney et al. and Darolia et al. has made possible a more stabilized TBC microstructures, it can be difficult to deposit a TBC by an evaporation process to produce a desired and uniform composition if the additional oxide has a significantly different vapor pressure (e.g., an

order of magnitude) than zirconia and yttria. For example, co-evaporation of YSZ and zirconium carbide (ZrC) as a source of carbides and/or carbon is complicated by the low partial pressure of ZrC, yielding a TBC that has an unacceptable nonuniform distribution of carbides. To avoid this result, separate ingots of YSZ and ZrC may be evaporated with a single electron beam using a controlled beam jumping technique, with the dwell time on each ingot being adjusted so that the energy output achieves the energy balance required to obtain compositional control of the vapor cloud that condenses on the targeted surface to form the desired coating. Alternatively, multiple electron guns can be operated at power levels suited for the particular material being evaporated by a given gun. Yet another approach disclosed in commonly-assigned U.S. Patent No. 6,790,486 ~~Application Serial No. 10/064,887~~ to Movchan et al. involves regulating when vapors from one or more evaporation sources are permitted to condense on the surface being coated, such that deposition only occurs while the relative amounts of vapors within the vapor cloud are at levels corresponding to the desired coating composition.

Please replace paragraph [0008] with the following amended paragraph:

According to one aspect of the invention, the process is particularly suited for use when the oxide of the carbide compound element has a vapor pressure that is significantly different from the oxide compounds. If a YSZ coating is to be deposited, particularly notable examples of such oxides include ytterbia, neodymia, and lanthana, each of which has a sufficient absolute percent ion size difference relative to zirconium ions to produce significant lattice strains that promote lower thermal conductivities. As a result of their significantly different vapor pressures, it is difficult to produce a ceramic coating having a uniform and desired composition by simultaneously evaporating one or more ingots of YSZ and any one or more of these oxides. In accordance with this invention, these oxides can be codeposited with YSZ by evaporating their corresponding carbides, i.e., YbC_2, NdC_2, and LaC_2, which dissociate during evaporation to form the oxide if sufficient oxygen is present within the vapor cloud to oxidize ~~oxide~~ the metal dissociated from the carbide. Furthermore, the process of this invention also

advantageously co-deposits one or more carbon-based constituents that also evolve from evaporation of the carbide(s), promoting stable porosity within the coating.

Please replace paragraph [0013] with the following amended paragraph:

According to a preferred aspect of the invention, the thermal-insulating material of the TBC 16 is based on binary yttria-stabilized zirconia (preferably zirconia stabilized by about 3 to about 8 weight percent yttria), and further alloyed to contain at least a third metal oxide. The invention particularly pertains to the deposition by evaporation of YSZ-based coatings in which one or more of the additional metal oxides have a vapor pressure that differs significantly from zirconia and yttria, defined herein as at least an order of magnitude higher or lower than zirconia and yttria. Though not a necessary feature of the invention, the third oxide preferably has the effect of reducing and/or stabilizing the thermal conductivity of the TBC 16. For this purpose, and in accordance with commonly-assigned U.S. Patent No. 6,586,115 to Rigney et al., the third oxide

preferably has a sufficient absolute percent ion size difference relative to zirconium ions to produce significant lattice strains that promote lower thermal conductivities. In accordance with commonly-assigned U.S. Patent No. 6,808,799 ~~Application Serial No. 10/064,785~~ to Darolia et al., the TBC 16 also contains entrapped carbon-containing gases (e.g., carbon monoxide (CO) and/or carbon dioxide (CO_2)) and possibly elemental carbon and/or carbides in the form of precipitate clusters, the thermal decomposition of which yields additional carbon-containing gas. In combination, the presence of entrapped CO and/or CO_2, elemental carbon and/or carbide clusters, and one or more of the above-specified third metal oxides are believed to reduce the density and thermal conductivity of the YSZ TBC 16.